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ABSTRACT

Written syntactic complexity is considered in relation to the four modes of discourse (argumentation, exposition, narration, and description). In a study of 153 children at three ability ranges within each of three grade levels (three, four, and five), syntactic complexity was found to differ significantly across the modes. The range of syntactic variability within one grade was found to almost equal syntactic maturity potential up through the twelfth grade. Writing development is discussed as an internally predisposed process stimulated by varying syntactic challenges. Implications for the development of language competence and cognitive processes are considered. (Author/AA)

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Written Syntactic Complexity and The Modes of Discourse

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Running head: Syntax and Modes

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Abstract

Written syntactic complexity is considered in relation to the four modes of discourse. Children at three ability ranges within each of three grade levels (3, 4, 5) produce significantly different syntactic complexity across the modes. The range of syntactic variability in one grade is shown to almost equal syntactic maturity potential up through the twelfth grade. Writing development is discussed as an internally predisposed process stimulated by varying syntactic challenges. Language performance is considered as crucial to formal development of language competence. Formal cognitive developmental processes - viewed as intimately related and parallel in operation to linguistic processes - are considered capable of analogous development by variably functional experiences.

Written Syntactic Complexity and the Modes of Discourse

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This study developed from recent advances in research regarding the maturing writer in school. Children move through a developmental sequence in learning to write, beginning by adding little sentences together, gradually moving through deletion and reduction strategies, to emerge--in a relatively short time--with complex subordinating and transforming powers. The process has been examined in detail by Hunt (1965, 1970) and Loban (1963, 1976).

Recently, the modes of discourse have added more light to the process involved in the maturing syntactic abilities of writers in their formative years. By modes of discourse, I refer to the classical differences among arguing a point of view (argumentation), explaining a process (exposition), telling a sequence of events (narration), and depicting details (description).

Seegars originated this direction in research with a 1933 study of fourth-, fifth-, and sixth-grade writings, which revealed how children arguing a point of view produce more complex sentences than they do writing an explanation or a narrative-description.

Syntactic Complexity

Since Hunt, many writing researchers have focused on syntactic complexity, the way a sentence becomes increasingly more elaborate via transformational processes which conjoin and embed full and reduced clauses and non-clause elements.

Differences in complexity of written products are analyzed through the T-unit, or "minimal terminable unit." Similar to Cazden's MLU (1972), the mean length of utterance in speech analysis, and to Loban's "communication unit," the T-unit is an objective description of what the layman would call a sentence in its most compact and complete form. Hunt devised the T-unit because

> ...grammar textbooks usually say that a sentence must have one main clause but may also have one or more subordinate clauses and various kinds of phrases attached to or embedded in it. So cutting a passage into T-units will be cutting it into the shortest units which it is grammatically allowable to punctuate as sentences. In this sense, the T-unit is minimal and terminable. Any complex or simple sentence would be one T-unit, but any compound or compound-complex sentence would consist of two or more T-units. (1970, p. 4)

The following fourth-grade writing sample will present the base for a T-unit analysis. As a child's punctuated sentence, it contains 25 words:

> The tortoise and the hare were racing and the hare had a hed start but the hare was showing of to much so he lost.

Using the Hunt method, the product contains four T-units, with an average of 6.2 words per T-unit:

1. The tortoise and the hare were racing.
2. And the hare had a head start.

3. But the hare was showing off too much.

4. So he lost.

In his cross-sectional study of writing at three grade levels, Hunt found fourth graders writing an average of 8.6 words per T-unit (w/T), eighth graders 11.5 w/T, and twelfth graders 14.4 w/T. In Loban's longitudinal study across grades K through 12, a similar developmental picture emerged. His random group means showed fourth graders writing an average of 8.02 words per communication unit (w/CU), eighth graders 10.37 w/CU, and twelfth graders 13.27 w/CU). Loban compares his unit to Hunt's, adding the meaning base as a check for communication purposes; syntactically, the two units are almost identical.

Other studies besides Loban's have validated the T-unit in writing (Miller and Ney, 1968; Mellon, 1969), and in both speech and writing (O'Donnell, Griffin, and Norris, 1967). Most recently, O'Donnell compared several syntactic indices and concluded that "in spite of lack of precision, T-unit length is still the most useful and useable index of syntactic development over a wide age-range" (1976, p. 38).

San Jose (1972) used the T-unit method to investigate the differences in fourth-grade writings across the modes. Like Seegars, she found that the highest level of syntactic complexity occurred in argumentatior, followed by exposition, narration, and description. Mode-based insights concerning syntax and quality also have been reported by Kincaid (1953), Johnson (1967), Bortz (1969), and Veal and Tillman (1971)

in writing; and in speech, by Pope (1974). The accumulating evidence suggests that the modes of discourse result in different levels of syntactic complexity. This variability in syntax leads to questions about possible natural development in writing.

Moffet, in his Teaching the Universe of Discourse, describes a "whole discourse" approach to composition, consisting of several aspects of the writing act, including the influence of the audience, subject matter, modes, environment, cognitive developmental stage, and other entities. In writing, students mesh all the separable parts of the composing process into a multi-dimensional act. Natural writing development requires context and real life involvement, in Moffett's view.

Cognitive Connections

Such concerns for natural writing development may provide insights for linking cognitive and linguistic developmental processes. Piaget portrays intellectual development as a process of equilibration, with cognitive structures moving from organization to re-organization. This equilibrium-disequilibrium-equilibrium process is effected by outside intrusions of experience. With each cognitive reorganization, the old structural operations are integrated into the newer, more complex ones. This can be compared to linguistic development, in that children attain higher levels of syntactic complexity by incorporating previous syntactic structures into more advanced ones (Menyuk, 1969; Chomsky, 1969).

Developmental psycholinguists have noted other similarities between linguistic and cognitive operations in language experiments involving

children at various developmental stages. Sinclair-de-Zwart (1969) concluded that cognitive and linguistic structuring processes parallel one another. Piaget (1970) saw the two structuring processes as leaning on each other in a circular manner.

Anderson and Bashaw (1967) studied qualitative changes accompanying first-grade themes in written description and argumentation via an experimental discussion-intervention program. They concluded that the measured effect on description may have been larger because of developmental constraints regarding the argumentation themes. As they put it: "The D (description) themes required some logical organization of thought but a minimum of abstraction as compared to the writing of A (argumentation) themes" (p. 248).

What is of interest here is the resulting implication of developmental constraints on writing in the various modes. Thus, the various modes of discourse may have their linguistic and cognitive requirements, which appear to underlie writing and thinking, producing a developmental connection that stands behind surface productions of language.

Charlesworth (1976) has commented: "Piaget's theory of development does not specify which real-life experiences are directly involved in the process of cognitive change. Hence, there is an important gap that has to be filled in to give his theory more credibility." Charlesworth points to psychologists and ethologists who have combined their talents to reveal "how Piaget's cognitive structures are 'naturally expressed' in the life of the child and have adaptive significance." (p. 161).

However, it may also be possible for linguistic studies to focus on how syntactic structures change, thereby producing insights for cognitive change.

The Present Study

To focus more closely on the process of writing development, I recently studied the relationship of the modes to the different writing abilities found within grade as well as across grade. For my study, I collected writings across the four modes from 153 third, fourth, and fifth graders. Representing rural, smalltown, and suburban populations in the metropolitan Atlanta area of Georgia, the all-white population included approximately equal numbers of boys and girls at each grade level.

Their six female teachers were coached in the procedures for collecting the writing. Each topic covered one of the four modes: argumentation, exposition, narration, and description. They were reversed by using two classes at each grade level. The four writing events were administered by the teachers themselves during 20-minute time periods in mid-morning. A one-day interval occurred between writings, and only two writing events were scheduled during one week. The entire collection process was completed in a two-week period during October 1975.

Considering the different grade levels, all teachers were asked to read each topic aloud, with the students following along silently. This was followed by a five-minute discussion period, with the teachers encouraged to answer all questions to the best of their abilities. They

were instructed to inform the children that spelling and handwriting were not crucial concerns and their writings would not be graded. The students were informed that the writings were to be used to learn more about how children at their grade level learned to write.

Each topic was printed on a separate sheet of 8 X 10 paper, preceded by lines for the student's name, school name, and date. The papers contained triple-spaced lines on the topic side, and the students were allowed to continue on the other side if they filled up the front. The topics, according to the mode, were:

Argumentation: "Children may someday go to school all year long. Some children in San Diego, California, do it now. Do you think it is a good idea? Why or why not?"

Exposition: "Where do you go and what do you do after school? Do you have a special place to go, a job to do, a friend to play with? Would you like to take a new friend with you after school? What can you tell about the best thing to do after school?"

Narration: "Tell about a TV show that you like a lot. What happens in the show? How does it make you feel? Do you think other children would like it, too?"

Description: "Write about yourself. Tell what you look like. Tell what you like to do. What is your school like? What do you do there? What do you do at recess? What is your favorite subject in school?"

In any mode-based study, it should be pointed out that the concept of "mode" is not a pure one. The fact that children are stimulated to write in the mode of argumentation, for example, does not mean they will write in an argumentative way exclusively. Modes of writing overlap; children writing in exposition may take time out from their explanation

to argue what's best at a critical point, to describe an entity being used, and even to narrate a related anecdote. Kantor (1976) has illustrated how a mixing of the modes occurs in fifth-grade writings.

With this in mind, the current study defines mode as a production in which the writer's attention is directed in one of the following ways;

1. In using language that--in the main--argues a point of view, defends a position, expresses an emotional inclination, or tries to persuade, the writer is considered to be writing in the mode of argumentation.

2. In using language that--in the main--explains a procedure or an experience (in a restricted framework), the writer is considered to be writing in the mode of exposition.

3. In using language that--in the main--tells a sequence of events, observances, or experiences, the writer is considered to be writing in the mode of narration.

4. In using language that--in the main--depicts people, places, things, and/or events in detail, the writer is considered to be writing in the mode of description.

The papers included in this study were those that met the above criteria. Some 612 papers were selected for the syntactic analysis. These papers represented writings in four modes by each of the 153 students participating.

The procedures used for segmenting the written productions into T-units were similar to those used by Hunt (1965), O'Donnell, Griffin, and Norris (1967), and O'Hare (1973). They are detailed in Perron (1974, pp. 103-110).

The students were divided into three ability groups at each grade level. Their assignments to high, middle and low ability groups were based on reading comprehension scores obtained from Gates-McGinitie tests

administered in April 1975. Instead of raw scores, the grade equivalents were used for consistency in the across-the-grades comparisons (Perron, upcoming).

The statistical procedures used in this study included analysis of variance, Pearson's r, and t-test procedures (Nie, 1975). Repeated measures procedures were also used (Dixon, 1973). All tests were run on the IBM 360/370 systems, with the support of the Educational Research Laboratory at the University of Georgia.

In summary, this study sought to determine if students' written syntactic structures--as measured by T-unit length means--would significantly differ across the modes of argumentation, exposition, narration, and description by ability group and within grade level.

Results

Analysis of variance procedures indicated that girls and boys--within each grade level--did not significantly differ in written syntactic complexity (3rd, $F(1,48)=.08$; 4th, $F(1,50)=1.17$; and 5th, $F(1,49)=.50$). Next their writings were investigated for differences by mode at each grade level. The results indicated that the girls and boys did not significantly differ in syntactic complexity within the modes in 11 of 12 tests.

The students' ability groupings were investigated by repeated measures procedures. Table 1 shows that all three grade levels showed consistent results, with low ability students at each grade level writing

at low syntactic levels, middle ability students writing at middle syntactic levels, and high ability students writing at high syntactic levels. The differences at each grade level were statistically significant at or beyond the .001 level.

Insert Table 1 about here.

In Table 2, the ability groups were investigated for differences in syntactic complexity across the modes. T-unit length means demonstrate significant differences occur at all ability levels within each grade level. With the exception of a reversal in the high and middle group means at the fourth-grade level in the argumentation mode, all means are shown to be consistently higher from mode to mode, from ability group to ability group, and from grade to grade.

Insert Table 2 about here.

In Table 3, the full group of 153 boys and girls is investigated across the modes at each grade level. The results show a consistent increase from grade to grade occurs in each mode. Within each grade level, the students' productions are shown to be significantly different across

the modes--at or beyond the .001 level.

Insert Table 3 about here.

For general trends, t-tests of paired mode means were run within each grade level. The results allowed the following rankings: Third grade: A > E > N > D; fourth grade: A > E = N > D; and fifth grade: A > E = N > D. At all grade levels, argumentation was shown to account for the highest syntactic complexity, while description was shown to account for the lowest.

Discussion and implications

The present study adds evidence to the accumulating data concerning the varying impact of the modes of discourse on the written syntactic complexity of elementary school children.

At each grade level, boys and girls of similar ability have been shown to produce writing in different modes that reveal significant differences in syntactic complexity. In addition, low, middle, and high ability writers at each grade level have been shown to utilize significantly different syntax within each of the four modes. Regardless of the grade level, also, the students at each grade level have been shown to produce different levels of syntactic complexity in different modes.

Among the modes, argumentation has been shown as the mode to

encourage the highest level of syntactic complexity in all ability groups and within all grade levels. Description has been shown as the mode which appears to encourage the least amount of complexity in syntax. At the third grade level, writers produced more complex syntax in exposition than in narration, but this difference disappeared in the fourth and fifth grades, as students produced syntax that did not significantly differ between the two modes.

Children at different grade levels also have been shown to operate within different ranges of written syntactic complexity. Third graders produced writings that ranged from an average of 6.20 words per T-unit (w/T) in description to 10.42 w/T in argumentation. Fourth graders wrote at a higher syntactic level, ranging from 7.59 w/T in description to 12.81 w/T in argumentation. And fifth graders wrote at a slightly higher syntactic level, ranging from 8.48 w/T in description to 13.06 w/T in argumentation.

Such a wide range of syntactic variability within one grade level becomes interesting in light of writing maturity studies, such as Hunt's, which shows an increase of 5.8 words per T-unit from fourth to twelfth grade, and Loban's, which shows longitudinal gains of 5.2 words per T-unit for the same eight-grade duration (using his random group means). Apparently, when it comes to syntax and writing fluency, the range of powers already controlled by writers at the fourth-grade level, for instance, is almost as broad as their potential for development throughout their remaining elementary and secondary school years.

Apparently, the modes of discourse present different syntactic challenges to writers in the elementary grades studied here. Such results indicate that performance tasks in writing encourages switches in underlying structures. Though attempts to express themselves in different discourse tasks, children experience different structural pathways basic to growth in written communication.

From the standpoint of the language arts curriculum, this study points out the need for teachers to recognize the importance of the argumentation and exposition modes--even in the early grades. Although Anderson and Bashaw indicate that developmental constraints may be at work in the early grades--in relation to argumentation--Kantor (1976) has illustrated how children interweave their mode bases in free writing; apparently, they use the more accessible modes (description and narration) to enter the more complex modes. Elsewhere (Perron, 1976c), I have illustrated how teachers might design a writing program to include content and mode-based shifts which would encourage the use of higher syntactic challenges of argumentation and exposition in the early and intermediate grades.

The competent writing teacher would be one who not only encouraged enjoyable, in-context writings experiences for children, but who saw to it that those experiences reflected a content base which covered all four modes. This point has been made in a different way by Moffett, but the syntactic evidence here suggests there may be more than just logical

sense to his "whole discourse" approach. If the syntactic potential within grade can be exercised by presenting the apparently different syntactic challenges of the various modes, young writers would be given opportunities to stretch their abilities--to an extent that can only by comparable to their potential for writing gains across the grades.

The results of this study may also be of interest to developmental psycholinguists concerned with the relationships between cognitive and linguistic development. The apparent stretching influences of the modes of discourse in writing imply that the writing mind actively interprets purpose via different levels of syntactic complexity. It appears that the writer may participate in the developmental process of structuring and restructuring syntactic entities simply by writing.

Under this view, the competence is seen as actively engaged in change by means of language performance. This would place function in language use in a crucial relationship with form; it would also place performance in an equally responsible position in regard to competence.

Human cognitive and linguistic development, then, would appear to be functionally, as well as formally, related. In both cases, underlying structures can be conceived as taking their clues for growth from experience. The speculation here is that experience, like syntax in language performance, may be structured differently for different purposes--especially in the developmental eye of the consumer, cognition.

Considering Charlesworth's comments regarding a gap in Piaget's theory, syntactic evidence may provide a source for explanation regarding real-life experiences directly involved in the cognitive change process.

Writing's evidence may provide a glimpse of a possible 'natural expression' encouraging cognitive change.

Piaget's definition of the mind as possessing its own built-in means for development, then, could be given linguistic definition. Not only may experience impinge upon the mind to stimulate equilibration, it may do so at varying levels or ranges of structural complexity. The functional base of those complexity ranges would play a role in assimilation-accommodation processes for structuring cognition.

Further Research

Further research is needed to investigate other influences on syntactic complexity, such as audience, personal interest, environment, subject matter--as well as the interaction of all such influences within the whole act of composing.

Further research is also needed to isolate the impact of the modes of discourse on writing development. By using mode variation as stimulus, it should be possible to determine the impact of the various modes through syntactic changes resulting under experimental conditions.

Research should also be undertaken in a related curricular area--reading. The modes and other influences suspected in syntactic variability may have a flip-side implication for reading. That is, along with our considerations in writing development, reading in the various modes of discourse may involve different syntactic challenges that lead naturally to increased reading fluency.

In psycholinguistic study, it may be possible to conceive of structural differences in cognitive operations which might be mapped out

as varied structural complexities--along the lines of syntactic complexity--to determine the impact of varied experiences upon cognitive development. Certainly, the evidence of this study suggests a theory of language performance which, among other things, values competence and performance equally.

Finally, the implications of the mode-based syntactic variations suggest the need for further research in syntactic maturity. It is apparent that the various influences on writing development will have to be isolated before any grade-level norms in syntactic maturity can be seriously considered.

Summary

The major thrust of this report has been to discuss some of the implications regarding syntactic variability. Written syntactic complexity has been considered in relation to the four modes of discourse: argumentation, exposition, narration, and description. Children at three ability levels within each of three grades (3,4,5) have been shown to produce significantly different syntactic complexity across the modes. The range of syntactic variability in one grade is shown to almost equal syntactic maturity potential up through the twelfth grade. Writing development has been considered as an internally predisposed process stimulated by varying syntactic challenges. Language performance has been considered as crucial to formal development of language competence. And formal cognitive developmental processes--viewed as intimately related and parallel in operation to linguistic processes--have been considered capable of analogous development by variably functional experiences.

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Table 1

Distribution Across Ability Groups of T-unit Length Means at each Grade Level

		Ability Group						
Grade	n	Low	SD	Middle	SD	High	SD	F-value
Third	15	6.10	.92	7.40	.69	8.69	1.52	12.57***
Fourth	15	7.68	.97	9.14	1.44	10.25	1.77	12.18***
Fifth	16	8.96	1.54	9.68	1.01	11.11	1.47	10.35***

Third & Fourth grades: df 2,42 (F-value at .001=8.25)

Fifth grade: df 2,45 (F-value at .001=8.25)

***--significant at or beyond the .001 level.

Table 2

Distribution Across the Modes
of T-unit Length Means by Ability
Group at each Grade Level

		Modes[a]				
Ability Group	n	D	N	E	A	F-value
Third						
Low	15	5.34	6.34	6.61	7.86	4.98**
Middle	15	6.02	7.40	7.46	10.62	11.53***
High	15	7.32	7.90	10.25	12.83	6.53**
Fourth						
Low	15	6.73	7.30	7.72	10.43	7.81***
Middle	15	7.29	8.84	9.06	14.63	20.28***
High	15	8.63	10.60	9.80	13.55	9.28***
Fifth						
Low	16	7.55	8.91	9.91	11.73	9.31***
Middle	16	8.28	9.91	10.42	12.77	9.43***
High	16	9.73	10.80	11.78	14.28	8.36***

df: 3,56 (F-value at .01=4.16; at .001=6.60)

**--significant at or beyond the .01 level

***--significant at or beyond the .001 level

[a]Modes: D=Description; N=Narration; E=Exposition; A=Argumentation

Table 3

Distribution Across the Modes
of T-unit Length Means
at each Grade Level

		Modes[a]					
Grade	n	D	N	E	A	df	F-value
Third	50	6.20	7.20	8.15	10.42	3,196	18.75***
Fourth	52	7.59	8.91	8.98	12.81	3,204	33.32***
Fifth	51	8.48	9.56	10.42	13.06	3,200	28.22***

df: 3,196 (F-value at .001=5.42)

***--significant at or beyond the .001 level

[a]Modes: D=Description; N=Narration; E=Exposition; A=Argumentation